

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application)	<u>PATENT APPLICATION</u>
)	
Inventor: Commins, et al.)	Art Unit: 3635
)	
Serial No.: 10/705,662)	Examiner: Horton, Yvonne M.
)	
Filed: November 10, 2003)	
)	
For: DIAPHRAGM WITH PERIMETER)	<u>Customer No. 28554</u>
EDGING ON STRUCTURAL PANELS)	
)	

APPEAL BRIEF UNDER 37 C.F.R. §41.37

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This brief is filed in response to the Examiner's Final Rejection dated March 9, 2006 and the Notification of Non-Compliant Appeal Brief mailed April 23, 2007. Applicants filed a Notice of Appeal on September 7, 2006.

The Commissioner is authorized to charge any underpayment or credit any overpayment to Deposit Account No. 501826 (Attorney Docket No. SIMP-51026US0) for any matter in connection with this Appeal Brief, including any fee for extension of time, which may be required.

Applicants respectfully request the consideration of the Examiner and the Appeal Board of the matters contained herein.

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I. REAL PARTY IN INTEREST

The real party in interest is Simpson Strong-Tie Company, Inc., the assignee of record, which is a subsidiary of Simpson Manufacturing Company, Inc.

II. RELATED APPEALS AND INTERFERENCES

None.

III. STATUS OF CLAIMS

Claim 1 stands rejected.

Claims 2 – 22 have been cancelled.

Claims 23 – 30 stand rejected.

Claims 1 and 23-30 are being appealed.

IV. STATUS OF AMENDMENTS

None.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Claim 1 is the first independent claim involved in this appeal. None of the other claims depend from claim 1. The subject matter of claim 1 relates generally to a diaphragm (see figures 1, 4, 7 and 8; and see p. 1, lines 1 – 7 and lines 24 - 36; p. 7, lines 26 – 28 and lines 35 – 36; p. 8, line 5 and lines 15 – 16) for resisting lateral forces (**w**) (see figures 20 and 21; and see p. 1, lines 16 - 23; p. 3, line 35 – p. 4, line 1; and p. 4, lines 4 - 9) imposed on a building structure (**8**) (figure 8). The diaphragm has an improved mechanical connection (see figure 3; and p. 1, lines 11 – 15; and p. 7, lines 14 - 16) between a structural panel (**1**) (see figures 1, 3, 4, 5, 7; and see p. 3, lines 9 – 21, and p. 7, lines 14 - 16) in the diaphragm and the framing members (**2**) (see p. 2, lines 23 – 25; p. 3, lines 22 – 31; p. 4, lines 9 – 11 and lines 31 – 34; and p. 7, lines 14 – 16) supporting the structural panel (**1**). The improved mechanical connection comprises:

- a. the structural panel (**1**) having a distal side (**3**) (see figures 1 and 3; and see p. 7, line 17), a proximal side (**4**) (see figures 1 and 3; and see p. 7, lines 17 – 18), and a plurality of edge faces (**5**) (see figures 3, 5 and 17);
- b. the plurality of framing members (**2**) disposed in registration with the proximal side (**4**) of the structural panel (**1**) near the edge faces (**5**);
- c. a plurality of perimeter fasteners (**7**) (see figures 1, 3, 6, 7 and 17; and see p. 2, line 26 – p. 3, line 5; and p. 7, line 20) connecting the structural panel (**1**) to the framing members (**2**); and
- d. means for reducing bending of said perimeter fasteners attached to a substantial number of the perimeter fasteners (**7**), the means for reducing bending of said perimeter fasteners acting when the lateral forces (**w**) are imposed on the building structure (**8**).

Claim 1 contains a means-plus-function element as contemplated by 35 U.S.C. §112, sixth paragraph. That element appears in the claim as “means for reducing bending of said perimeter fasteners”. Structures

identified in the specification as corresponding to the “means for reducing bending of said perimeter fasteners” are:

- a. a plurality of individual, substantially u-shaped clips (**17**) (see figures 17, 18 and 19; and see p. 8, lines 19 – 22, p. 4, lines 4 – 8; and p. 18, lines 10 – 14);
- b. a single perimeter edging member (**18**) (see figure 2; and see p. 8, lines 19 – 23 and line 27 – p. 9, line 3; and p. 9, lines 9 – 14);
- c. a plurality of perimeter edging members (see for example figures 1, 3, 4, 5, 7, 9, and 15; and see p. 8, lines 19 – 26; and p. 9, lines 15 – 22);
- d. elongated strips (**19**) (see figures 9 -16; and see p. 8, line 36 – p. 9, line 3; p. 9, line 15 – 20; p. 9, line 23 – p. 10, line 3; p. 17, lines 22 – 27; and p. 18, line 3 – 9); and
- e. elongated, substantially u-shaped perimeter edging members (**21**) (see figures 1 and 3 – 7; and see p. 8, line 36 – p. 9, line 3; p. 9, lines 15 – 22, p. 10, line 4 – p. 11, line 8; p. 13, lines 22 – 27; and p. 17, line 34 – p. 18, line 2).

The material from which the “means for reducing perimeter fasteners” can be created is discussed at p. 11, lines 9 – 15.

Claim 23 is the second independent claim involved in this appeal. The remaining claims in the application depend from claim 23. The subject matter of claim 23 relates generally to a diaphragm (see figures 1, 4, 7 and 8; and see p. 1, lines 1 – 7 and lines 24 - 36; p. 7, lines 26 – 28 and lines 35 – 36; and p. 8, line 5 and lines 15 – 16) for resisting lateral forces (**w**) (see figures 20 and 21; and see p. 1, lines 16 - 23; p. 3, line 35 – p. 4, line 1; and p. 4, lines 4 - 9) imposed on a building structure (**8**) (figure 8). The diaphragm has an improved mechanical connection (see figure 3; and p. 1, lines 11 – 15; and p. 7, lines 14 - 16), which comprises:

a. a plurality of structural panels (1) (see figures 1, 3, 4, 5, 7; and see p. 3, lines 9 – 21, and p. 7, lines 14 - 16), each having a distal side (3) (see figures 1 and 3; and see p. 7, line 17), a proximal side (4) (see figures 1 and 3; and see p. 7, lines 17 – 18), and a plurality of edge faces (5) (see figures 3, 5 and 17);

b. a first elongated framing member (2) (see p. 2, lines 23 – 25; p. 3, lines 22 – 31; p. 4, lines 9 – 11 and lines 31 – 34; and p. 7, lines 14 – 16) disposed in registration with said proximal sides (4) of said structural panels (1) near one of said edge faces (5) of each of said structural panels (1) and one or more second elongated framing members (2) disposed in registration with said proximal sides (4) of said structural panels (1) near a different one of said edge faces (5) of each of said structural panels (1);

c. a plurality of perimeter fasteners (7) (see figures 1, 3, 6, 7 and 17; and see p. 2, line 26 – p. 3, line 5; and p. 7, line 20) connecting each of said structural panels (1) to said first elongated framing member (2), said perimeter fasteners (7) not passing all the way through said first elongated framing member (2); and

d. means for reducing bending of said perimeter fasteners attached to at least several perimeter fasteners (7) of said plurality of perimeter fasteners (7) connecting each of said structural panels (1) to said first elongated framing member (2), said means for reducing bending of said perimeter fasteners acting when said lateral forces (w) are imposed on said building structure (8) (figure 8), said means for reducing bending of said perimeter fasteners having portions disposed on said distal sides (3) of said structural panels (1), and said means for reducing bending of said perimeter fasteners not extending substantially beyond said first elongated framing member (2).

Claim 23 contains a means-plus-function element as contemplated by 35 U.S.C. §112, sixth paragraph. That element appears in the claim as “means for reducing bending of said perimeter fasteners”. Structures identified in the specification as corresponding to the “means for reducing bending of said perimeter fasteners” are:

- a. a plurality of individual, substantially u-shaped clips (**17**) (see figures 17, 18 and 19; and see p. 8, lines 19 – 22, p. 4, lines 4 – 8; and p. 18, lines 10 – 14);
- b. a single perimeter edging member (**18**) (see figure 2; and see p. 8, lines 19 – 23 and line 27 – p. 9, line 3; and p. 9, lines 9 – 14);
- c. a plurality of perimeter edging members (see for example figures 1, 3, 4, 5, 7, 9, and 15; and see p. 8, lines 19 – 26; and p. 9, lines 15 – 22);
- d. elongated strips (**19**) (see figures 9 -16; and see p. 8, line 36 – p. 9, line 3; p. 9, line 15 – 20 and line 23 – p. 10, line 3; p. 17, lines 22 – 27; and p. 18, and line 3 – 9);
- e. elongated, substantially u-shaped perimeter edging members (**21**) (see figures 1 and 3 – 7; and see p. 8, line 36 – p. 9, line 3; p. 9, lines 15 – 22, p. 10, line 4 – p. 11, line 8; p. 13, lines 22 – 27; and p. 17, line 34 – p. 18, line 2).

The material from which the “means for reducing perimeter fasteners” can be created is discussed at p. 11, lines 9 – 15.

Claim 24 depends from claim 23 and calls for the plurality of perimeter fasteners (**7**) to be closely spaced (see p. 12, lines 13 – 19). Claim 24 incorporates all of the limitations of claim 23, and thereby contains the means-plus-function element described in claimed 23. (See the summary of claim 23 above.)

Claim 25 depends from claim 24, and calls for the plurality of perimeter fasteners (**7**) to be spaced approximately 2" apart (see p. 12, lines 13 – 19) in a direction generally parallel to the edge faces (**5**) of the structural panels (**1**) to which the first elongated framing member (**2**) is connected. Claim 25 incorporates all of the limitations of claim 24, and thereby contains the means-plus-function element described in claimed 23. (See the summary of claim 23 above.)

Claim 26 depends from claim 25 and calls for the structural panels (1) to be made from wood (see p. 12, lines 28 – 29). Claim 26 incorporates all of the limitations of claim 25, and thereby contains the means-plus-function element described in claimed 23. (See the summary of claim 23 above.)

Claim 27 depends from claim 23 and specifies that the “means for reducing bending of said perimeter fasteners” of claim 23 consists of a perimeter edging member, said perimeter edging member being disposed near said edge face (5) of said structural panels (1) to which said first elongated member (2) is attached. Claim 27 depends from claim 23 and uses the means-plus-function element described in claim 23. (See the summary of claim 23 above.)

Claim 28 depends from claim 27 and further specifies that the perimeter edging member of claim 27 is formed as an elongated member (19) with a first face member (20). Claim 28 incorporates the limitations of claim 27, and thereby contains the means-plus-function element described in claimed 23. (See the summary of claim 23 above.)

Claim 29 depends from claim 28 and calls for the first face member (20) of the perimeter edging member to be disposed on the distal sides (3) of the structural panels (1) near the edge faces (5) of the structural panels (1). Claim 29 incorporates all of the limitations of claim 28, and thereby contains the means-plus-function element described in claimed 23. (See the summary of claim 23 above.)

Claim 30 depends from claim 29 and calls for the “means for reducing bending of said perimeter fasteners” to be made from light gauge, sheet metal (see p. 11, lines 9 – 15). Claim 30 incorporates all of the

limitations of claim 29, and thereby contains the means-plus-function element described in claimed 23. (See the summary of claim 23 above.)

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 1 and 23 — 30 are unpatentable under 35 U.S.C. § 103(a) over U.S. Patent 5,706,626 granted to Mueller in view of either U.S. Patent 4,037,381 granted to Charles, or U.S. Patent 5,390,466 granted to Johnson et al.

Whether claims 25 and 26 are unpatentable under 35 U.S.C. § 103(a) over U.S. Patent 5,706,626 granted to Mueller.

VII. ARGUMENT

Claims 1, 23 – 30 are not Obvious Under 35 U.S.C. §103(a) over U.S. Patent 5,706,626 in view of U.S. Patent 4,037,381, or U.S. Patent 5,390,466.

One of ordinary skill in the art would not find the claimed invention obvious under 35 U.S.C. § 103(a) in light of U.S. Patent Number 5,706,626, granted to Mueller (“Mueller”), in combination with either U.S. Patent 4,037,381, granted to Charles (“Charles”), or U.S. Patent 5,390,466, granted to Johnson et al. (“Johnson”). These claims do not stand or fall together.

One of ordinary skill would not make the combination of references set forth by the Examiner in asserting the invention is obvious. The Examiner states:

MUELLER discloses the basic claimed diaphragm except for explicitly detailing the use of a means for reducing bending of the fasteners. Both brackets and washers are old and very well known in the art for their ability to reduce fasteners from bending as a result of forces being applied thereto. However, both CHARLES and JOHNSON et al. teach that it is known in the art to provide a structural panel with a means, either in the form of brackets (56) in CHARLES or washers (32, 35) in JOHNSON et al., for reducing bending of fasteners. (Office Action Dated March 9, 2006, page 2)

This combination is not supported by any motivation or suggestion found in the references, nor any evidence of record. Rather, this improper combination ignores the evidence of record and the teachings of the prior art.

This ground of rejection is based on the Examiner’s unsupported assertions of “common knowledge.” The combination suggested by the Examiner does not meet all of the limitations of the claims that stand rejected under this first ground.

Applicants’ arguments with respect to each claim that stands rejected are provided below.

Claim 1

A. One of Ordinary Skill in the Art would not Modify Mueller's Steel Wall Teachings to Provide a "means for reducing bending of [the] perimeter fasteners" as Defined in Claim 1.

Independent claim 1 calls for "means for reducing bending of [the] perimeter fasteners." One of ordinary skill in the art would not modify Mueller's steel wall with a "means for reducing bending of [the] perimeter fasteners".

Combining the references as suggested by the Examiner is not supported by the references, and is refuted by the Declaration of Mr. Steve Pryor introduced into the record by Applicants on December 19, 2005. Under 35 U.S.C. §103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. (M.P.E.P. §2141).

Respectfully, the Examiner ignores the fact that the primary reference in the prior art is a steel wall, and that what one of ordinary skill would find obvious is determined relative to the steel wall teachings of the prior art. The evidence shows that one of average skill would not modify a steel wall in the manner asserted by the Examiner.

1. Steel Walls and Wood Walls are Different, and One Would Not Modify a Steel Wall to Reduce Perimeter Fastener Bending.

Steel panel walls perform differently than wood panel walls. (Pryor Declaration, ¶ 9). In particular, the desired failure mechanism in a steel wall is different from the desired failure mechanism in a wood wall. (Pryor Declaration, ¶ 9).

Mueller discloses a steel diaphragm wall. (Mueller, Col. 6, lines 42-64). The function of the fasteners 124 is to "... securely interconnect the inner retaining member 114, the reinforcing members 116, the diaphragm members 110a and 110b and the outer retaining member 120." (Mueller, Col. 5, lines 41-43).

Each of these elements 114, 116, 110 and 120 is 18 gauge steel. (See Mueller, Col. 6, lines 42-64). The approximate thickness of 18 gauge steel is approximately 0.050". (<http://www.engineersedge.com/gauge.htm>).

Applicants' patent disclosure teaches that the need for the present invention was discovered by Applicants as they tested wood structural panel walls that were typically used in building construction at the time such invention was made. Such walls include one or more structural panels (e.g., plywood or Oriented Strand Board), framing members (e.g., 2" x 4" or 4" x 4" studs), and a plurality of perimeter fasteners (e.g., nails, screws or staples) connecting one or more of the framing members to one or more of the structural panels. (Application, p. 1, lines 1-15, p. 2, lines 1-4, p. 2, lines 26-28). Through cyclic testing of various conventional wood walls, Applicants discovered that the perimeter fasteners were the critical weak link through which failure of the overall system occurs. (Application, p. 3, lines 2-5). The application teaches that the predominant failure mode in commonly constructed wood walls is the flexing and fatiguing of the nails around the perimeter or outer edges of the structure that connect the structural panels to the frame of the diaphragm. (Application, p. 5, lines 1-4). The invention includes certain "means for reducing bending of [the] perimeter fasteners" and an improved mechanical connection that results in better performance of wood shear walls and diaphragms.

In steel walls, the predominant failure mode is not the flexing and fatiguing of fasteners around the perimeter or outer edges of the structural panels. (Pryor Declaration, ¶ 18). Steel walls should be designed to avoid any brittle failure mode such as fastener failure, which would result in sudden failure in a manner that would not allow other elements of the structure to begin to participate in resisting the load (a process known as load sharing). (Pryor Declaration, ¶ 17). Thus, one skilled in the art designing a steel wall like the Mueller wall should select fasteners of sufficient size and strength to ensure that the failure of the wall does not occur at the fastener. (Pryor Declaration, ¶¶ 16-18). In a wood wall, in contrast, the non-linear yielding behavior associated with the bending of the fastener and the crushing of the wooden panel and post around the fastener

is desirable, as such crushing and deformation actions dissipate the lateral forces imposed on the wood wall. (Pryor Declaration, ¶¶ 10-11).

Simpson Strong-Tie Company, Inc. ("Simpson") is the owner by assignment of the present application. Simpson also owns the Mueller patent, which was assigned to it in 1999. (Pryor Declaration, ¶ 7). Shortly after the assignment was made, Mr. Mueller provided Simpson with photographs and documentation related to cyclic, dynamic testing of certain steel structural panel walls that are very similar to the embodiments disclosed in the Mueller patent. (Pryor Declaration, ¶¶ 7, 14-15).

The photographs and documents related to the testing of the Mueller wall, which are attached as exhibits to the Pryor Declaration, demonstrate that the side posts and panels of the Mueller wall buckle and fail prior to any bending or breaking of the fasteners that hold such elements together. (Pryor Declaration, ¶ 17, Exhibits 1, 2). Such a failure mode is consistent with what would be expected by one skilled in the art looking at Mueller, and is also consistent with the disclosure in the Mueller patent specification. (Pryor Declaration, ¶ 17; Mueller patent, Col. 2, lines 58-60, Col. 9, lines 5-8.) Thus, the scope and content of the prior art – Mueller – teaches a steel wall which is not susceptible to the same failure modes as that which motivated the present claim to a “means for reducing bending.”

2. One of Average Skill Would not Modify Mueller With a "Means for Reducing Bending" Because Such Means is not Required by Mueller.

One of ordinary skill with knowledge of Mueller, would not seek to modify Mueller because the claimed “means” is not required by Mueller.

Mr. Pryor notes in his Declaration some of the reasons why steel walls fail differently than wood walls. (Pryor Declaration, ¶¶ 9-12, 16-17). In a properly designed steel wall that had panels attached to the side posts, failure of the screws themselves would not be the failure mode. The reaction of fasteners in such steel walls is distinct from wood walls. (Pryor Declaration, ¶ 17). One skilled in the art would design such a

steel wall by selecting screws that do not bend or shear, and by limiting the thickness of the steel posts to allow the screws to pivot or rotate and thereby prevent shear failure of the screws. (Pryor Declaration, ¶ 17). The International Building Code, in its provisions for the seismic design of steel sheathed walls with cold-rolled posts or studs, limits the base metal thickness of the cold-formed steel posts or studs to which the panels are attached to 0.048". (Section 2211.4.4, the International Building Code, introduced into the record December 19, 2005). Thus, when shear forces push the sheathing or panel past the post, the thin-walled studs will be able to deform which will allow the screw to pivot or rotate, and thus protect the screw from shear failure. Thus, as Mr. Pryor explains, bending of the perimeter fasteners in the Mueller wall is not an issue he would consider or try to address if asked to improve the connection between the panels and vertical side posts of the Mueller wall. (Pryor Declaration, ¶ 18).

Given the manner in which steel walls are designed and constructed, one skilled in the art would not be motivated to add to the structure of Mueller any "means for reducing bending of [the] perimeter fasteners." (Pryor Declaration, ¶¶ 18, 19). In the Mueller wall, no means for reducing bending is desired or required. (Pryor Declaration, ¶ 17). Thus, one skilled in the art would not combine the Charles brackets or the Johnson washers with the Mueller wall in the manner suggested by the Examiner. (Pryor Declaration, ¶ 19).

3. There is No Suggestion in the References Cited to Combine the Teachings of Mueller with the Teachings of Charles or Johnson.

The Examiner has not identified any suggestion or need disclosed in Mueller to reduce the fasteners 124 from bending, and nothing in Mueller's teachings supports this contention. To the contrary, Mueller suggests that the steel sheets tend to buckle when the wall is under load. (See Mueller, Col. 2, lines 58-60; Col. 9, lines 5-8). The fact that Mueller does not teach that the fasteners need to be supported is not surprising since one skilled in the art would design such a wall so that the fasteners do not bend or shear. (Pryor Declaration, ¶¶ 17-18).

First, none of the references suggest the need for such a combination, and no support is provided for the conclusions cited above, other than the opinion of the Examiner. Neither Charles nor Johnson teaches that it is known in the art to provide a structural panel with means for reducing bending of fasteners. Johnson does not ascribe such a purpose for washers 32; and for washers 35, Johnson teaches that these insulate the fasteners, so they do not become thermal conductors. (Johnson, Col. 8, lines 42-47). Similarly, Charles teaches brackets that are attached to studs in a wall with fasteners, but does not teach that the brackets reduce the bending of those fasteners.

Neither Charles nor Johnson suggests the combination of structural elements described in claims 1, nor do they even address seismic loading of panels. The Charles patent relates to a building panel having attachment tabs which can be nailed to the sides of usual building wall studs in order to reduce the time and expense associated with the construction of an exterior stucco wall. (Charles, Col. 1, lines 1-35). The brackets in Charles are tabs used for attaching the panels to studs and are themselves "relatively thin" (22 or 24 gauge - approximately .025 inch thick) sheet metal, "spot welded or riveted" to the frames and nailed to the stud. (Charles, Col. 4, lines 5-18). The purpose of the brackets in Charles is to secure the panel to the stud, and the Charles specification suggests bending each tab to form the leg necessary to complete the attachment. (Charles, Col. 4, lines 25-28). Charles does not suggest that the tabs could act as "means for reducing bending of [the] perimeter fasteners" in a shear wall, nor does Charles suggest that the tabs may be used as an attachment mechanism for a structure like the Mueller wall.

The washers in Johnson are a combination of metallic and thermal insulating washers. The Johnson patent relates to panels that have novel structures adapted to protect the interior of the building from intrusion of heat and cold, from fire, and/or, in some embodiments, from small arms gunfire. (Johnson, Col. 2, lines 41-44). The purpose of the washers is not to stop fastener bending, but to provide insulation between the members of the pre-fabricated unit. (Johnson, Col. 5, line 67 - Col. 6, line 3; Col. 6, line 37-41). There is no suggestion to use the metal washers 32 or insulating washers 35 in a structure like the Mueller wall, nor is

there any suggestion that the washers could function as a "means for reducing bending of [the] perimeter fasteners" in a shear wall.

Hence, there is no motivation in the references cited to combine the teachings of Mueller with the teachings of Charles or Johnson, and, as demonstrated by Mr. Pryor's Declaration, one skilled in the art of designing metal walls for shear resistance would not in fact combine the teachings of such references as asserted. (Pryor Declaration, ¶ 19).

The Examiner's rejection is not supported by the record, and allowance of claim 1 is therefore requested.

B. No Support Exists for the Examiner's Position.

1. There is No Evidence to Refute Mr. Pryor.

Among other things, Mr. Pryor's Declaration confirms that steel walls like the Mueller wall would be designed by selecting fasteners of sufficient size and strength to ensure that the fasteners do not bend or shear prior to the buckling of the panels or side posts. (Pryor Declaration, ¶ 18). Mr. Pryor states that a skilled designer would not choose to combine the Charles brackets or Johnson washers with the Mueller wall, as suggested by the Examiner. (Pryor Declaration, ¶ 19). Mr. Pryor also states that if the Charles brackets or the Johnson washers were added to the screws of the Mueller wall; he would not expect the overall performance of the wall to improve, nor would he expect that such washers or brackets would reduce the bending of the fasteners. (Pryor Declaration, ¶ 19).

Applicant's submission of Mr. Pryor's Declaration as evidence is unrefuted in the record.

2. The Examiner's Assertions are Based Solely on Traversed Assertions of "Common Knowledge".

Applicants have specifically traversed the Examiner's assertion that "brackets and washers are old and very well known in the art for the ability to reduce fasteners from bending as a result of forces being applied

thereto." Applicants also specifically traverse the Examiner's assertion that "without additional brackets or washers, when force is imposed on the [Mueller] structure the fasteners will tend to break or fracture and not be able to maintain its structural integrity." Applicants respectfully request that the Examiner provide support for these statements in accordance with M.P.E.P. §2144.03(c): "If Applicant Challenges a Factual Assertion as Not Properly Officially Noticed or not Properly Based Upon Common Knowledge, the Examiner Must Support the Finding With Adequate Evidence."

The Examiner has pointed to no teachings in the references, nor provided any evidentiary support for the above statements. Moreover, Mr. Pryor's Declaration specifically addresses and refutes the conclusion that "it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the structure of Mueller with the means for reducing bending of fasteners of either Charles or Johnson." (Pryor Declaration, ¶ 19). Mr. Pryor further explains that a skilled designer would not try to prevent rotation or pivoting of the screws connecting the panels to the posts of the Mueller wall, and emphasizes that bending of the fasteners is not an issue that a skilled designer would try to address in steel walls like Mueller. (Pryor Declaration, ¶¶ 17, 18, 19).

Mr. Pryor's Declaration also specifically refutes the statement that, "without additional brackets or washers, when a force is imposed on the structure the fasteners will tend to break or fracture and not be able to maintain its structural integrity." Among other things, Mr. Pryor's Declaration and the documents attached thereto demonstrate that the Mueller wall fails due to buckling of the panels and the side posts, and that none of the screws joining such panels and side posts appear to be bent or broken when the wall was subjected to cyclic testing. (Pryor Declaration, ¶¶ 17, 18).

Hence, there is no evidence to support the Examiner's rejections and such rejections must be overturned.

C. Adding the Charles Brackets or the Johnson Washers to the Mueller Wall Would Not Result in a Means for Reducing Bending of the Perimeter Fasteners.

1. Adding Washers or Brackets to the Mueller Wall Would Not Reduce the Bending of Fasteners.

As explained in detail above, the fasteners 124 of the Mueller wall will not bend or shear prior to the time that the panels and side posts of the Mueller wall will buckle and fail when subjected to loading. (Pryor Declaration, ¶¶ 18, 19). The failure mode for the Mueller wall is not the fasteners. (Pryor Declaration, ¶¶ 17, 18).

According to Mr. Pryor, adding washers or brackets to the structure of Mueller will not function as a structure to reduce the bending of the fasteners or otherwise improve the overall performance of the wall. (Pryor Declaration, ¶ 19). In fact, adding washers under the fasteners in the Mueller wall would be unlikely to have any effect on how the Mueller wall fails at ultimate load, since the observed ultimate failure of the Mueller wall is caused by the buckling of the panels and the side posts. (Pryor Declaration, ¶¶ 17, 19).

Hence, the proposed combination would not result in the claimed invention, and the Examiner's rejection is not supported by the evidence.

2. Equivalent Structure is Not Shown in Charles or Johnson.

The means-plus-function language specifically describes corresponding structure in the specification performing a specific function. See, for example, page 8, line 19 - page 12, line 11, and additional sections of the specification identifying other or equivalent structures.

A claim limitation expressed in means-plus-function language "shall be construed to cover the corresponding structure described in the specification and equivalents thereof." 35 U.S.C. § 112, paragraph 6. As set forth in *In re Donaldson*, 29 USPQ2d 1845, 1848 (Federal Circuit 1994), "one construing means-plus-function language in a claim must look to the specification and interpret that language in light of the

corresponding structure, material, or acts described therein, and equivalents thereof, to the extent that the specification provides such disclosure." Moreover, the USPTO must apply 35 U.S.C. § 112, sixth paragraph, and give claims their broadest reasonable interpretation, in light of, and consistent with the written description of the invention in the application. See *In re Donaldson*, 29 USPQ2d 1845, 1850 (Federal Circuit 1994) (M.P.E.P. § 2181).

The Johnson brackets and Charles washers do not provide a "...means for, reducing bending of said perimeter fasteners acting when said lateral forces are imposed on said building structure..." Since equivalent structure is not shown in the cited prior art, Applicants respectfully request that the rejections be withdrawn.

D. The Examiner Cannot Use Hindsight to Assemble the Elements.

An invention is not obvious where old and well-known elements are put to a new and unique use. "The claimed invention must be considered as a whole, and the question is whether there is something in the prior art as a whole to suggest the desirability, and thus the obviousness of making the combination..." *Lindermann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 221 USPQ 481, 488 (Fed. Cir. 1984). The best that can be said of Charles and Johnson is that they teach the use of brackets and washers that receive fasteners. It also appears that the Examiner is improperly using the Applicant's own invention as the suggestion to make the combination. "Obviousness cannot be established by combining the teaching of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination." *ACS Hospital Systems, Inc. v. Motnefiore Hospital*, 221 USPQ 929, 933 (Fed. Cir. 1984). As noted above, the Final Office Action dated March 9, 2006 states:

Without additional bracket or washers, when a force is imposed on the structure the fastener will tend to break or fracture and not be able to maintain its structural integrity. However, brackets and washers provide fasteners with the strength needed to withstand forces imposed thereon.

The Examiner implies that the prior art teaches this combination; however, the only support for this statement comes in Applicants' own specification, where at the top of page 5, it states:

[The inventors] discovered that the predominant failure mode is the flexing and fatiguing of the nails around the perimeter or outer edges of the structural panels that connect the structural panels to the frame of the diaphragm. The present invention addresses this problem, allowing shearwalls and diaphragms to be both stronger and stiffer.

Hence the Examiner has improperly derived the motivation and suggestion to combine the references from hindsight, and the rejection is therefore improper. The claims should therefore be allowed.

E. Mueller's Teachings are Limited by It's Own Scope, not Applicant's Claims.

Certain assertions made by the Examiner in her Response to Arguments in the Office Action Dated March 9, 2006 are immaterial.

In response to Applicant's points about the teachings of Mueller, the Examiner stated "... there is nothing in the claim that would make this 'means' for reducing bending in a steel wall as opposed to a wood wall". One interpretation of such a statement is that the claims should be limited to wood walls in order to consider the Mueller steel wall teachings relevant to one of ordinary skill.

This interpretation reflects a misunderstanding of the assertions made herein and the law of obviousness. Mueller, as a steel wall, does not teach that a means for reducing bending is required in any "diaphragm for resisting lateral forces imposed on a building structure".

That the claim does not include a limitation to a wood or steel wall is immaterial to whether one of ordinary skill would modify prior art comprising an all steel wall to add such a "means" to the prior art to reach the claimed invention.

In responding to Applicants' arguments in the Final Office Action dated March 9, 2006, the Examiner also *mischaracterizes* the Applicant's argument as suggesting there *is* motivation to combine the references:

Regarding the applicant's argument that there is motivation to combine either JOHNSON or CHARLES with MUELLER just to add an additional washer or bracket because steel walls perform differently than wood walls, the examiner agrees.

Applicant has consistently asserted the contrary. The Examiner's statement that Applicants have argued otherwise is incorrect.

Claim 23

The Examiner rejected claims 1 and 23 together, making no distinction between the claims. Claims 1 and 23 are not identical.

The Examiner has failed to set forth a *prima facie* case of obviousness as to claim 23. Claim 23 specifies that the perimeter fasteners do not "[pass] all the way through [the] elongated framing member." See claim 23, sub-part c.

The Examiner has entirely failed to address this limitation in the Final Office Action of March 9, 2006. To make a *primary facie* case of obviousness, the Examiner must show that all of the elements and limitations are rendered obvious, not just selected elements and limitations. The Examiner has failed to show that any of the references teach, the claimed limitation that the perimeter fasteners do not "[pass] all the way through [the] elongated framing member".

Applicants respectfully submit that none of the references cited contain such structure.

In addition, all of Applicants' arguments with respect to claim 1 are equally applicable to claim 23, and are incorporated under this heading, but for the sake of brevity are not repeated.

Hence for the reasons set forth above with respect to claim 1, and those set forth specifically with respect to claim 23, it is respectfully submitted claim 23 is allowable.

Claim 24

Claim 24 depends from claim 23 and includes the additional limitation that the “plurality of perimeter fasteners are closely spaced.”

The arguments made above with respect to claim 23, both generally and specifically, apply with equal weight to claim 24. These arguments are incorporated under this heading, but are not repeated for the sake of brevity.

In addition, the Examiner has not set forth a *prima facie* case of obviousness with respect to claim 24. The Examiner points to no teaching in the prior art identifying that the “perimeter fasteners are closely spaced.” In rejecting Claim 24, the Examiner merely states “...[r]egarding claim 24, the fasteners are closely spaced.” There is no explanation of why one of average skill would find it obvious to combine closely spaced perimeter fasteners with the other structural elements of the claim.

Hence, for the reasons set forth above with respect to claim 1 and those set forth with respect to claim 24, it is respectfully submitted claim 24 is allowable.

Claim 25

Claim 25 depends from claim 24, which depends from claim 23, and includes only the additional limitation that the “plurality of perimeter fasteners are spaced approximately 2” apart in a direction generally parallel to [the] edge faces of [the] structural panels...”

The arguments made above with respect to claim 23, both generally and specifically, apply with equal weight to claim 25. These arguments are incorporated under this heading, but are not repeated for the sake of brevity.

In addition, the Examiner has not set forth a *prima facie* case of obviousness with respect to claim 25 under this ground of rejection. The Examiner does not specifically point to any corresponding element in the prior art for the limitations found in claim 25 under this ground of rejection. The rejection of claim 25 under

this ground of rejection is completely silent and unsupported. The Examiner's rejection of claim 25 under this ground is therefore improper.

Hence, for the reasons set forth above, it is respectfully submitted claim 25 is allowable.

Claim 26

Claim 26 depends from claim 25, which ultimately depends from claim 23, and includes only the additional limitation that the "structural panels are made from wood."

The arguments made above with respect to claim 23, both generally and specifically, apply with equal weight to claim 26. These arguments are incorporated under this heading, but are not repeated for the sake of brevity.

In addition, the Examiner has not set forth a *prima facie* case of obviousness with respect to claim 26. The Examiner does not specifically point to any corresponding element in the prior art for the limitation found in claim 26 under this ground of rejection. The rejection of claim 26 under this ground of rejection is completely silent and unsupported. The Examiner's rejection of claim 26 under this ground is therefore improper.

Hence, for the reasons set forth above, it is respectfully submitted claim 26 is allowable.

Claim 27

Claim 27 depends from claim 23, and incorporates all of the elements of claim 23, except that claim 27 more specifically describes the structure of the "means for reducing bending of said perimeter fasteners" of claim 23 and its location.

With respect to claim 27, the Examiner's rejection is also improper because the Examiner has failed to show that all of the elements of the claim are rendered obvious by the combination proposed by the Examiner.

In rejecting claim 27, the Examiner characterizes elements in Mueller that were already described and characterized in the Examiner's rejection of claim 23 (from which claim 27 depends) in a different manner. In the rejection of claim 23, the group of elements consisting of 102a,b, 104, 106 and 140 are treated as being equivalent to the framing members of the claim (see the Examiner's Final Office Action dated March 9, 2006, page 2) and in the rejection of claim 27, the same group of elements 102a,b, 104, 106 and 140 are treated as being equivalent to the perimeter edging member of the claim. (See the Examiner's Final Office Action dated March 9, 2006, page 3.) This single group of elements cannot serve as the basis for rejecting two separately defined elements set forth in the claim.

In rejecting claim 23, the Examiner has used the same structure of Mueller to teach two structural elements in Applicants' claim. Such a rejection is not consistent with the law of obviousness. In order to teach claim 27, the Mueller patent must disclose both "...framing members..." and "...means for reducing bending of said perimeter fasteners...", arranged in the manner set forth in the claim, including their relationship with respect to the perimeter fasteners and the structural panels.

Considering all of the limitations of the elements in claim 27, the Mueller side posts (102a,b), horizontal upper member (104), horizontal lower member (106), and reinforcing members (140) cannot serve both as the "framing member" and the "means for reducing bending of the perimeter fasteners" of the claim.

For all of the reasons stated, the Examiner has failed to make a *prima facie* case of obviousness with respect to claim 27 and the claim is allowable.

Claim 28

Claim 28 depends from claim 27, which depends from claim 23, and includes only the additional limitation that the "perimeter edging member is formed as an elongated member with a first face member."

The arguments made above with respect to claims 23 and 27, both generally and specifically, apply with equal weight to claim 28. These arguments are incorporated under this heading, but are not repeated for the sake of brevity.

In addition to the arguments already set forth, the Examiner again characterizes elements in Mueller that were already described and characterized in the Examiner's rejection of claim 23 in a different manner. In the rejection of claim 23, the group of elements consisting of 102a,b, 104, 106 and 140 are treated as being equivalent to the "framing members" of the claim (see the Examiner's Final Office Action dated March 9, 2006, page 2) and in the rejection of claim 27, the same group of elements 102a,b, 104, 106 and 140 are treated as being equivalent to the "perimeter edging member" of the claim. (See the Examiner's Final Office Action dated March 9, 2006, page 3.) This single group of elements cannot serve as the basis for rejecting two elements defined in the claim.

Therefore, the Examiner has not made a *prima facie* case of obviousness and claim 28 is therefore allowable.

Claim 29

Claim 29 depends from claim 28, which depends from claims 27 and 23, and includes only the additional limitation that the "first face member of said perimeter edging member is disposed on said distal sides of said structural panels near said edge faces of said structural panels."

The Examiner has failed to set forth a *prima facie* rejection of obviousness by again using elements 102 a,b, 104, 106 and 140 as the basis for the rejections in a manner inconsistent with the use in rejecting the

parent claim 23. The Examiner again refers to these elements as the “means for reducing bending” rather than the framing members, as in the rejection of claim 23.

The arguments made above with respect to claim 23, 27 and 28, both generally and specifically, apply with equal weight to claim 29. These arguments are incorporated under this heading, but are not repeated for the sake of brevity.

Hence, the Examiner has not made a *prima facie* case of obviousness in setting forth this rejection, and claim 29 is therefore allowable.

Claim 30

Claim 30 depends from claim 29, which depends from claims 28, 27 and 23, and includes only the additional limitation that the “means for reducing bending of said perimeter fasteners is made from light gauge, sheet metal.”

The Examiner has failed to set forth a *prima facie* rejection of obviousness by again using elements 102 a,b, 104, 106 and 140 as the basis for the rejections in a manner inconsistent with the use in rejecting the parent claim 23. The Examiner again refers to these elements as the “means for reducing bending” rather than the framing members, as in the rejection of claim 23.

The arguments made above with respect to claim 23, 27, 28 and 29, both generally and specifically, apply with equal weight to claim 30. These arguments are incorporated under this heading, but are not repeated for the sake of brevity.

Hence, the Examiner has not made a *prima facie* case of obviousness and claim 30 is therefore allowable.

Claims 25 and 26 are not Obvious under 35 U.S.C. §103(a) over U.S. Patent 5,706,626.

The Examiner has rejected claims 25 and 26 as being obvious under 35 U.S.C. §103(a) in light of U.S. Patent Number 5,706,626, granted to Mueller (“Mueller”). These claims do not stand or fall together.

Applicants arguments with respect to each claim that stand rejected are provided below.

Claim 25

The Examiner’s rejection of Claim 25 contradicts the Examiner’s rejection of Independent Claim 23 from which it depends and hence, the Examiner fails to make a *prima facie* rejection of claim 25.

Claim 25 was rejected under the first ground along with claim 23.

In rejecting claim 25, under this separate ground, the Examiner states: “MUELLER discloses the basic claimed diaphragm except for explicitly detail[sic] a fastener spacing of 2 inches...” Examiner’s Final Action of March 9, 2006, page 3.

In rejecting claim 23 the Examiner states: “MUELLER discloses the basic claimed diaphragm except for explicitly detailing the use of a means for reducing bending of the [perimeter] fasteners.” Examiner’s Final Office Action dated March 9, 2006, page 2.

By the Examiner’s own admission, Mueller lacks both the specified spacing of the perimeter fasteners and the “means for reducing bending of said perimeter fasteners” called for in claim 25.

Having failed to show that every element and limitation of the claim is present or suggested by the prior art, the Examiner’s rejection on this ground must fail. Claim 25 is therefore allowable.

Claim 26

Claim 26 depends from claim 25 and includes only the additional limitation that the “structural panels are made from wood.”

The arguments made above with respect to claim 25, both generally and specifically, apply with equal weight to claim 26. These arguments are incorporated under this heading, but are not repeated for the sake of brevity.

Furthermore, the Examiner uses hindsight in arguing that selecting wood as the material for the structural panel is “an obvious matter of design choice.” Examiner’s Final Office Action dated March 9, 2006, page 4. Applicants note that the table in the specification of the present application, at page 19, shows a notable increase in the strength of wood-panel shear walls, when made according to the present invention. In comparison, neither Mueller nor the comments by the Examiner suggest that it is desirable to use wood as the material for the panel of a shear wall.

Hence, for the reasons set forth above, claim 26 is allowable.

CONCLUSION

Applicants believe that the claims are in condition for allowance and respectfully request that the Board allow the application.

Should further questions remain, the representatives of the Patent Office are invited to contact the undersigned attorney by telephone.

The Commissioner is authorized to charge any underpayment or credit any overpayment to Deposit Account No. 501826 for any matter in connection with this response, including any fee for extension of time, which may be required.

Respectfully submitted,

Date: May 14, 2007

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VIII. CLAIMS APPENDIX

1. (original) In a diaphragm for resisting lateral forces imposed on a building structure, an improved mechanical connection between a structural panel in said diaphragm and the framing members supporting said structural panel, said improved mechanical connection comprising:

- a. said structural panel having a distal side, a proximal side, and a plurality of edge faces;
- b. said plurality of framing members disposed in registration with said proximal side of said structural panel near said edge faces;
- c. a plurality of perimeter fasteners connecting said structural panel to said framing members;
and
- d. means for reducing bending of said perimeter fasteners attached to a substantial number of said perimeter fasteners, said means for reducing bending of said perimeter fasteners acting when said lateral forces are imposed on said building structure.

2-22. (cancelled)

23. (previously presented) In a diaphragm for resisting lateral forces imposed on a building structure, an improved mechanical connection comprising:

- a. a plurality of structural panels, each having a distal side, a proximal side and a plurality of edge faces;
- b. a first elongated framing member disposed in registration with said proximal sides of said structural panels near one of said edge faces of each of said structural panels and one or more second elongated framing members disposed in registration with said proximal sides of said structural panels near a different one of said edge faces of each of said structural panels;

c. a plurality of perimeter fasteners connecting each of said structural panels to said first elongated framing member, said perimeter fasteners not passing all the way through said first elongated framing member; and

d. means for reducing bending of said perimeter fasteners attached to at least several perimeter fasteners of said plurality of perimeter fasteners connecting each of said structural panels to said first elongated framing member, said means for reducing bending of said perimeter fasteners acting when said lateral forces are imposed on said building structure, said means for reducing bending of said perimeter fasteners having portions disposed on said distal sides of said structural panels, and said means for reducing bending of said perimeter fasteners not extending substantially beyond said first elongated framing member.

24. (previously presented) The connection of claim 23 wherein:

said plurality of perimeter fasteners are closely spaced.

25. (previously presented) The connection of claim 24 wherein:

said plurality of perimeter fasteners are spaced approximately 2" apart in a direction generally parallel to said edge faces of said structural panels to which said first elongated framing member is connected.

26. (previously presented) The connection of claim 25 wherein:

said structural panels are made from wood.

27. (previously presented) The connection of claim 23, wherein:

said means for reducing bending of said perimeter fasteners consists of a perimeter edging member, said perimeter edging member being disposed near said edge face of said structural panels to which said first elongated member is attached.

28. (previously presented) The connection of claim 27, wherein:

said perimeter edging member is formed as an elongated member with a first face member.

29. (previously presented) The connection of claim 28, wherein:

said first face member of said perimeter edging member is disposed on said distal sides of said structural panels near said edge faces of said structural panels.

30. (previously presented) The connection of claim 29, wherein:

said means for reducing bending of said perimeter fasteners is made from light gauge, sheet metal.

IX. EVIDENCE APPENDIX

A. Applicants rely on the Declaration of Steven Pryor pursuant to 37 CFR §1.132 and the exhibits attached thereto — Exhibit 1, pages 1 – 11 and Exhibit 2, pages 1 – 37. The declaration of Steve Pryor and the exhibits attached thereto were introduced into the record on December 19, 2005, by Applicants in their Response to the Examiner's Office Action of June 17, 2005.

B. Applicants also rely on Sections 2211.4.1 — 221.4.7 of the 2003 International Building Code, a true copy of which is attached hereto and was introduced into the record on December 19, 2005, by Applicants in their Response to the Examiner's Office Action of June 17, 2005.

C. Both Applicants and the Examiner rely on U.S. Patent 5,706,626, granted to Lee W. Mueller on January 13, 1998. The Examiner introduced this patent in the record when the Examiner relied upon it to make the rejection under 35 U.S.C. §102(b) in the Examiner's Office Action of June 9, 2004.

D. Both Applicants and the Examiner rely on U.S. Patent 4,037,381 granted to Charles. The Examiner introduced this patent in the record when the Examiner relied upon the reference to make the rejection under 35 U.S.C. §102(b) in the Examiner's Office Action of June 17, 2005.

E. Both Applicants and the Examiner rely on U.S. Patent 5,390,466, granted to Johnson et al. The Examiner introduced this patent in the record when the Examiner relied upon the reference to make the rejection under 35 U.S.C. §102(b) in the Examiner's Office Action of June 17, 2005.

X. RELATED PROCEEDINGS APPENDIX

None.